

**REMARKS**

This Amendment, submitted in response to the non-final Office Action dated December 8, 2004, is believed to be fully responsive to the points of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

The Examiner objected to FIGS. 1 and 2. As requested by the Examiner, FIGS. 1 and 2 have been labeled as prior art, in that they merely illustrate exemplary internally and externally manifolded fuel cell stacks.

The Examiner objected to FIGS. 3, 5 and 12 for including reference number 300. Reference number 300 has been replaced in FIGS. 3, 5 and 12 by reference number 105. Reference number 105 has also been added to FIG. 6. Support for the amendments can be found, for example, in paragraph 28 on page 7 of the present application. Reference numeral 92 has also been added to FIGS. 3 and 12.

The Examiner objected to FIGS. 6 and 10 for including reference number 250. However, flow regulators 250 are discussed in paragraphs 25 (page 6) through paragraph 27 (page 7) of the present application.

The Examiner objected to the drawings for failing to include reference numbers 105, 113 and 320. As noted above, reference number 105 has been added to FIGS. 3, 5, 6 and 12. Reference number 320 has been added to FIG. 7. Support for this amendment can be found in paragraph 29 on page 8, for example. FIG. 10 has been corrected to replace reference number 100 with reference number 113, to indicate the bypass flow exit of this embodiments, as described in paragraph 28 on page 7 continuing to page 8.

The Examiner objected to the drawings for using reference number 251 to designate both flow regulator and control sensor. Paragraph 31 on page 9 is amended above to replace 251 with 211, as shown in FIG. 12.

The Examiner objected to the drawings for using both reference numbers 251 and 211 to designate control sensor. As noted above, 251 has been replaced by 211 in paragraph 31 on page 9. Applicant suspects that the Examiner may have intended to object to the use of reference numerals 211 and 254 (not 251) for the control sensor. If that is the case, Applicant notes that a separate reference numeral 211 was used to indicate the control sensor at a control point, which is also indicated by reference numeral 211.

On page 4 of the office action, the Examiner objected to the specification for informalities regarding certain reference numbers. FIG. 1 has been amended to replace reference number 310 with 315, as indicated in Paragraph 22. Paragraph 24 is amended above per the Examiner's suggestion.

In view of these amendments to the drawings and Specification, Applicant respectfully requests that the objections to the drawings and Specification in numbered paragraphs 1-6 of the Office Action be withdrawn.

Turning to the claims, Claims 1-31, 40 and 41 are pending. Claims 32-39 have been cancelled. Claim 29 is amended above.

Claims 1-4, 9, 13, 21-23, 25, 32-34, 38, 40 and 41 have been rejected under 35 USC 102(b) over JP 10-255827. Claims 5 and 6 have been rejected under 35 USC 103(a) over JP 10-255827, in view of JP9-223512. Claims 7 and 8 have been rejected under 35 USC 103(a) over JP 10-255827, in view of JP9-223512, in view of "Applicants' admitted prior art." Claim 12 has been rejected under 35 USC 103(a) over JP 10-255827, in view of U.S. Patent No. 5,413,878 (Williams). Claims 14 and 15 have been rejected under 35 USC 103(a) over JP 10-255827, in view of EP0374368. Claim 16 has been rejected under 35 USC 103(a) over JP 10-255827, in view of U.S. Patent No. 4,859,545 (Scheffler). Claims 17, 19 and 20 have been rejected under 35 USC 103(a) over JP 10-255827, in view of "Applicant's admitted prior art." Claim 18 has been rejected under 35 USC 103(a) over JP 10-255827, in view of "Applicant's admitted prior art," and in further view of EP0374368. Claims 26, 27, 30 and 31 have been rejected under 35 USC 103(a) over JP 10-255827, in view of "Applicant's admitted prior art," in further view of EP 0374368. Claims 28 and 29 have been rejected under 35 USC 103(a) over JP 10-255827, "Applicant's admitted prior art," EP 0347368, and JP9-223512. Claim 39 has been rejected under 35 USC 103(a) over JP 10-255827, in view of Scheffler. Claims 35-37 have been rejected under 35 USC 103(a) over JP 10-255827, in view of JP9-223512, in further view of "Applicant's admitted prior art." Claims 10, 11 and 24 have been rejected under 35 USC 103(a) over JP 10-255827, in view of Gillett.

Applicant respectfully submits the following remarks in support of the patentability of the claims.

**1. Claims 1-4, 9, 13, 21-23, 25, 40 and 41:**

Claims 1-4, 9, 13, 21-23, 25, 32-34, 38, 40 and 41 stand rejected under 35 USC 102(b) over JP 10-255827. Claim 1 is directed to a fuel cell assembly that includes a housing having an inlet and an outlet and defining at least one bypass flow channel. The bypass flow channel is configured to be in fluid communication with the inlet, and the inlet and outlet are configured to provide fluid communication to and from the housing, respectively. The fuel cell assembly further includes at least one fuel cell stack disposed within the housing and defining at least one direct flow channel. The fuel cell stack has at least one fuel cell, and the direct flow channel is configured to be in fluid communication with the inlet and outlet. The fuel cell assembly further includes a control system, which is configured to control an oxidant flow from said inlet to said direct and bypass flow channels.

In contrast, JP 10-255827 employs a bypass valve 8 so as to secure a passage of fuel gas by cooperating with cutoff operation of a fuel gas flow of a fuel cell on which abnormality is caused (Abstract). Similarly, JP 10-255827 employs an oxidizing gas bypass valve 9 to secure a passage of oxidizing gas by cooperating with a cutoff operation of an oxidizing gas flow control valve 7 (Abstract). Neither the English language abstract nor the figures of JP 10-255827 appear to disclose a housing defining at least one bypass channel, as recited by Claim 1 and shown, for example, in FIG. 3 of the present application. Beneficially, by employing at least one bypass channel defined by the housing, the bypass channel(s) helps to cool the fuel cell stack.

For at least these reasons, Applicant respectfully submits that Claim 1 is not anticipated by JP 10-255827. Further, as Claims 2-4, 9 and 13 depend from Claim 1, JP 10-255827 does not anticipate Claims 2-4, 9 and 13, for at least the reasons presented above with respect to Claim 1. Accordingly, Applicant respectfully requests that the rejections of Claims 1-4, 9 and 13 under 35 USC 102(b) over JP 10-255827 be withdrawn.

Similarly, independent Claim 21 is directed to a fuel cell assembly that includes in part a housing having an inlet and an outlet, where the inlet and outlet are configured to

provide fluid communication to and from the housing, respectively. The fuel cell assembly further includes at least one bypass flow duct extending along the housing and configured to be in fluid communication with the inlet. In contrast, neither the English language abstract nor the figures of JP 10-255827 disclose a bypass flow duct extending along a housing, as recited by Claim 21.

For at least these reasons, Applicant respectfully submits that Claim 21 is not anticipated by JP 10-255827. Further, as Claims 22, 23 and 25 depend from Claim 21, JP 10-255827 does not anticipate Claims 22, 23 and 25 for at least the reasons presented above with respect to Claim 21. Accordingly, Applicant respectfully requests that the rejections of Claims 21, 22, 23 and 25 under 35 USC 102(b) over JP 10-255827 be withdrawn.

Claim 40 is directed to a fuel cell assembly that includes, in part, a housing having an inlet and an outlet and defining at least one bypass flow channel, which is configured to be in fluid communication with the inlet and the outlet, where the inlet and outlet are configured to provide fluid communication to and from the housing, respectively. In contrast, neither the English language abstract nor the figures of JP 10-255827 disclose a bypass flow channel defined by a housing. For at least these reasons, Applicant respectfully submits that Claim 40 is not anticipated by JP 10-255827, and as Claim 41 depends from Claim 40, these reasons apply to claim 41, as well. Accordingly, Applicant respectfully requests that the rejections of Claims 40 and 41 under 35 USC 102(b) over JP 10-255827 be withdrawn.

## **2. Claims 5 and 6:**

Claims 5 and 6 have been rejected under 35 USC 103(a) over JP 10-255827, in view of JP9-223512. Claim 5 depends from Claim 1 and further recites that the control sensor is configured to monitor a parameter selected from the group consisting of temperature, voltage, electrical current, and heat flux. Claim 6 depends from Claim 5 and further recites that the control sensor comprises a temperature sensor.

On page 8 of the Office Action, the Examiner indicates that the English language abstract of JP 10-255827 merely indicates that the bypass control device is provided for

abnormalities. JP9-223512 is thus cited to supply the specific recitations of dependent Claims 5 and 6.

JP9-223512 is directed to a fuel cell abnormality monitoring method involving measuring temperature because the temperature variation follows the load current variation, in order to detect the instrumented current density distribution in the electrode inplane of the fuel battery for its abnormality. Based on the English language abstract and figures, JP9-223512 does not disclose at least one bypass channel defined by a housing, as recited by Claim 1. Nor does JP9-223512 appear to teach using temperature as a feedback signal for a control system that is configured to control an oxidant flow from an inlet of a housing to direct and bypass flow channels. Accordingly, JP9-223512 does not supply the above-discussed deficiencies of JP 10-255827. For at least these reasons, Applicant respectfully submits that Claims 5 and 6 are patentably distinguishable from the cited art, either alone or in combination. Accordingly, Applicant requests that the rejections of Claims 5 and 6 under 35 USC 103(a) be withdrawn.

**3. Claims 7 and 8:**

Claims 7 and 8 have been rejected under 35 USC 103(a) over JP 10-255827, in view of JP9-223512, in view of "Applicants' admitted prior art." Claim 7 depends from Claim 1 and further recites that the control sensor comprises an invasive temperature sensor, which is in intimate contact with a downstream control point. Similarly, Claim 8 depends from Claim 1 and further recites that the control sensor comprises a non-invasive temperature sensor, which is in remote communication with an upstream control point.

The reasons presented above with respect to Claims 5 and 6 apply with equal force to Claims 7 and 8. In addition, Applicant wishes to address the remarks made on page 9 of the Office Action. Paragraph 25 of the present application explains that both invasive and non-invasive temperature sensors are known. However, Paragraph 25 does suggest that the claimed use of such sensors is known. Accordingly, Applicant respectfully submits that the Examiner has not pointed to any specific teaching in the art to employ an invasive temperature sensor, which is in intimate contact with a downstream control point (Claim 7). Nor, has the examiner pointed to any specific teaching in the art

to employ a non-invasive temperature sensor, which is in remote communication with an upstream control point (Claim 8).

Accordingly, Applicant respectfully submits that Claims 7 and 8 are patentably distinguishable from the cited art, either alone or in combination. Accordingly, Applicant requests that the rejections of Claims 7 and 8 under 35 USC 103(a) be withdrawn.

**4. Claim 12:**

Claim 12 has been rejected under 35 USC 103(a) over JP 10-255827, in view of U.S. Patent No. 5,413,878 (Williams). Claim 12 depends from claims 1 and 2 and further recites that the outlet is configured to be in fluid communication with a subsequent inlet of a subsequent fuel cell assembly. Williams is cited to supply this additional recitation of Claim 12. However, Williams does not supply deficiencies of JP 10-255827 discussed above with respect to Claim 1. Accordingly, Applicant respectfully submits that Claim 12 is patentably distinguishable from the cited art, either alone or in combination. Accordingly, Applicant requests that the rejection of Claim 12 under 35 USC 103(a) be withdrawn.

**5. Claims 14 and 15:**

Claims 14 and 15 have been rejected under 35 USC 103(a) over JP 10-255827, in view of EP0374368. Claims 14 and 15 depend from Claim 1. Claim 14 further recites that the housing is configured to be pressurized, and the inlet is configured to be in fluid communication with a preceding outlet of a turbine engine. Claim 15 further recites that the housing is configured to be pressurized, and the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine.

The Examiner cites EP0374368 to supply the additional recitations of Claims 14 and 15. Applicant respectfully submits that EP0374368 does not disclose an inlet configured to be in fluid communication with a preceding outlet of a turbine engine, as recited by Claim 14. Rather, the outlet of turbine 16 goes to exhaust (Figure).

Applicant further submits that EP0374368 does not supply the above-described deficiencies of JP 10-255827. In particular, although the Figure of EP0374368 shows flow of purge air around fuel cell stack 8, the air flow from compressor 10 is separate,

and EP0374368 does not teach a control system, which is configured to control an oxidant flow from an inlet to direct and bypass flow channels, as is recited by Claim 1.

For at least these reasons, Applicant respectfully submits that Claims 14 and 15 are patentably distinguishable from the cited art, either alone or in combination. Accordingly, Applicant requests that the rejections of Claims 14 and 15 under 35 USC 103(a) be withdrawn.

**6. Claim 16:**

Claim 16 has been rejected under 35 USC 103(a) over JP 10-255827, in view of U.S. Patent No. 4,859,545 (Scheffler). Claim 16 depends from claim 1 and further recites that the bypass flow channel is configured to recycle at least a portion of the oxidant flow through the bypass flow channel to the inlet. As noted by the Examiner, JP 10-255827 does not teach or suggest a bypass flow channel, which is configured to recycle at least a portion of the oxidant flow through the bypass flow channel to the inlet, as recited by Claim 16. Scheffler is cited to supply this deficiency of JP 10-255827.

Scheffler is directed to cathode flow control for a fuel cell power plant. Scheffler employs a cathode exhaust recirculating loop 24 for recirculating cathode exhaust. In contrast, the claimed bypass flow channel recycles at least a portion of the oxidant flow through the bypass flow channel to the inlet.

Applicant respectfully submits that Scheffler neither supplies the deficiencies of JP 10-255827 discussed above with respect to claim 1 nor discloses the additional recitation of Claim 16. For at least these reasons, Applicant respectfully submits that Claim 16 is patentably distinguishable from the cited art, either alone or in combination. Accordingly, Applicant requests that the rejection of Claim 16 under 35 USC 103(a) be withdrawn.

**7. Claims 17, 19 and 20:**

Claims 17, 19 and 20 have been rejected under 35 USC 103(a) over JP 10-255827, in view of "Applicant's admitted prior art." Claims 17, 19 and 20 depend from Claim 1. Accordingly, the reasons presented above with respect to Claim 1 apply with equal force to these claims. Accordingly, Applicant respectfully submits that Claims 17,

19 and 20 are patentably distinguishable over the cited art. Accordingly, Applicant requests that the rejections of Claims 17, 19 and 20 under 35 USC 103(a) be withdrawn.

**8. Claim 18:**

Claim 18 has been rejected under 35 USC 103(a) over JP 10-255827, in view of "Applicant's admitted prior art," and in further view of EP0374368. Claim 18 depends from Claim 1. The reasons presented above with respect to Claim 1 in numbered paragraphs 1 and 2 apply with equal force to Claim 18. Accordingly, Applicant respectfully submits that Claim 18 is patentably distinguishable over the cited art, either alone or in combination. Accordingly, Applicant requests that the rejection of Claims 18 under 35 USC 103(a) be withdrawn.

**9. Claim 26, 27, 30 and 31:**

Claims 26, 27, 30 and 31 have been rejected under 35 USC 103a over JP 10-255827, in view of "Applicant's admitted prior art," in further view of EP 0374368. Independent Claim 26 is directed to a solid oxide fuel cell assembly including a pressure vessel having an inlet and an outlet and defining at least one bypass flow channel, the bypass flow channel being configured to be in fluid communication with the inlet, and the inlet and outlet being configured to provide fluid communication to and from the pressure vessel respectively. The solid oxide fuel cell assembly further including at least one planar solid oxide fuel cell stack disposed within the pressure vessel and defining at least one direct flow channel, the planar solid oxide fuel cell stack including at least one planar solid oxide fuel cell, and the direct flow channel being configured to be in fluid communication with the inlet and outlet. The solid oxide fuel cell assembly further including a control system, which is configured to adjust an oxidant flow from the inlet to the direct and bypass flow channels in response to a feedback signal.

As discussed above in numbered paragraphs 1 and 2 with respect to claim 1, JP 10-255827 and EP 0374368 do not disclose a bypass flow channel defined by a pressure vessel with a control system, which is configured to adjust an oxidant flow from the inlet to the direct and bypass flow channels in response to a feedback signal. Applicants admitted prior art does not supply these deficiencies of JP 10-255827 and EP 0374368.



For at least these reasons, Applicant respectfully submits that Claim 26 is patentably distinguishable over the cited art, either alone or in combination. Further, as Claims 27, 30 and 31 depend from Claim 26, these claims are also patentably distinguishable over the cited art for at least these reasons. Additionally, Claim 30 further recites that the inlet is configured to be in fluid communication with a preceding outlet of a turbine engine. As discussed above with respect to Claim 14, EP0374368 does not disclose an inlet configured to be in fluid communication with a preceding outlet of a turbine engine, as recited by Claim 14. Rather, the outlet of turbine 16 goes to exhaust (Figure). Applicant respectfully submits that Claim 30 is patentably distinguishable over the cited art for this additional reason, as well. In view of the above, Applicant requests that the rejections of Claims 26, 27, 30 and 31 under 35 USC 103(a) be withdrawn.

**10. Claims 28 and 29:**

Claims 28 and 29 have been rejected under 35 USC 103(a) over JP 10-255827, Applicant's admitted prior art, EP 0347368, and JP9-223512. Claims 28 and 29 depend from Claim 26. Claim 29 has been amended to correct its dependency. The Examiner cites JP9-223512 to supply the temperature sensor recitation of Claim 28. However, JP9-223512 does not supply the above-discussed deficiencies of JP 10-255827, EP 0347368 and Applicant's admitted prior art. Accordingly, Applicant respectfully submits that Claims 28 and 29 are patentably distinguishable over the cited art, either alone or in combination. Accordingly, Applicant requests that the rejections of Claims 28 and 29 under 35 USC 103(a) be withdrawn.

**11. Claims 10, 11 and 24:**

Claims 10, 11 and 24 have been rejected under 35 USC 103(a) over JP 10-255827, in view of Gillett et al (US Patent No. 6,764,784). Claim 10 depends from Claim 1 and further recites that bypass oxidant flow channel is defined by the fuel cell stack and the housing and extends along an inner surface of the housing. Neither the English language abstract nor figures of JP 10-255827 teach or suggest a bypass oxidant flow channel that is defined by a fuel cell stack and a housing, as recited by Claim 10. Nor do the English language abstract and figures of JP 10-255827 disclose a bypass oxidant flow channel that extends along an inner surface of the housing, as recited by

Claim 10. The Examiner cites Gillett as support for this later deficiency of JP 10-255827. However, although Gillett discusses ducting generally, Gillett does not disclose a bypass oxidant flow channel that extends along an inner surface of the housing.

Claim 11 depends from claim 1 and further recites a flow liner disposed within the housing, where the bypass flow channel is disposed between the flow liner and the housing and extends along an inner surface of the housing. The Examiner cites Gillett as disclosing thermal insulation. However, Gillett does not disclose a bypass flow channel, which is disposed between a flow liner and a housing and which extends along an inner surface of the housing, as recited by Claim 11.

Claim 24 depends from Claim 21 and further recites that the bypass flow duct is disposed within the housing. Applicant respectfully submits that Gillett does not disclose a bypass flow duct. Nor does Gillett supply the deficiencies of JP 10-255827 that are discussed above with respect to Claim 21.

In view of the above, Applicant respectfully submits that Claims 10, 11 and 21 are patentably distinguishable over the cited art, either alone or in combination. Accordingly, Applicant requests that the rejections of Claims 10, 11 and 21 under 35 USC 103(a) be withdrawn.

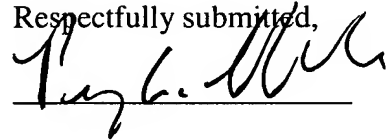
**CONCLUSION**

In view of the foregoing, Applicant respectfully submits that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

**Please charge all applicable fees associated with the submittal of this Response and any other fees applicable to this application to the Assignee's Deposit Account No. 07-0868.**

Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact Applicant's undersigned representative at the telephone number below.

Respectfully submitted,



Penny A. Clarke  
Reg. No. 46, 627

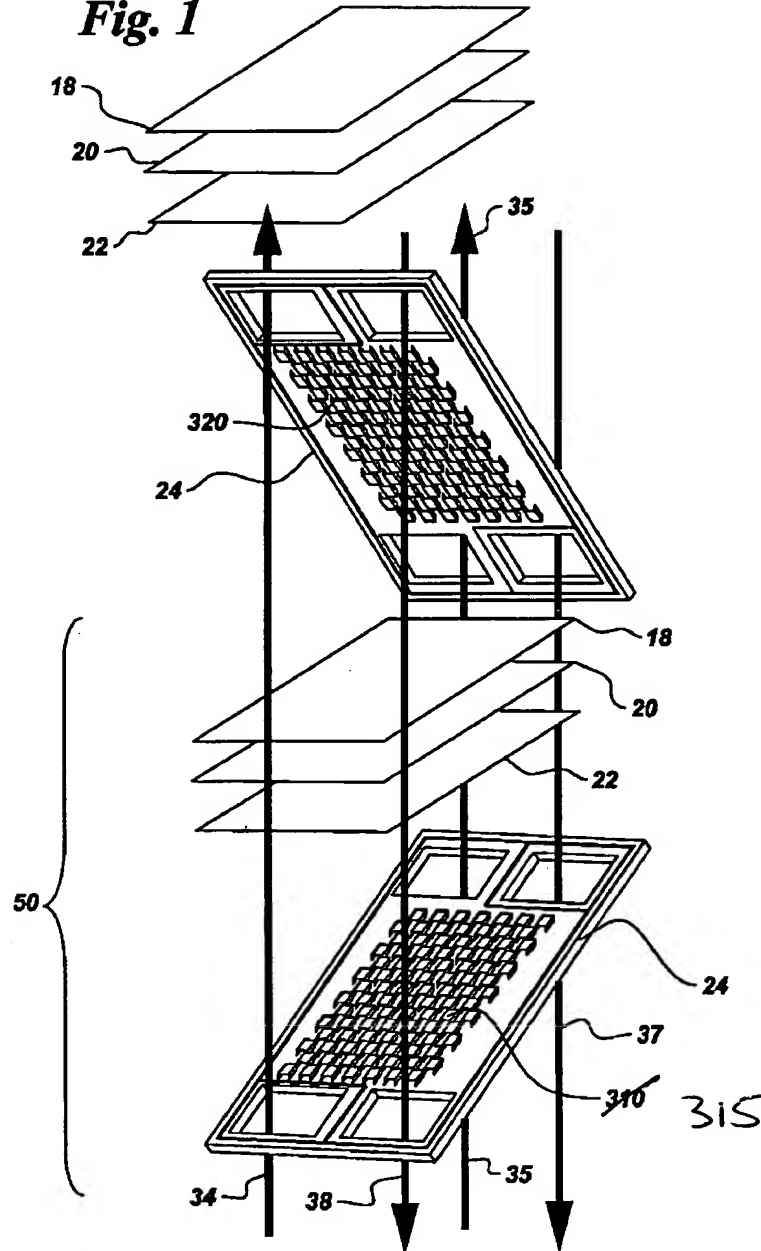
General Electric Company  
Building K1, Room 3A72  
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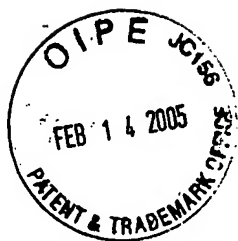
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 Inventor(s): R. S. Bunker  
 Docket No.: 120478  
 Attorney: P. Clarke  
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**Fig. 1**

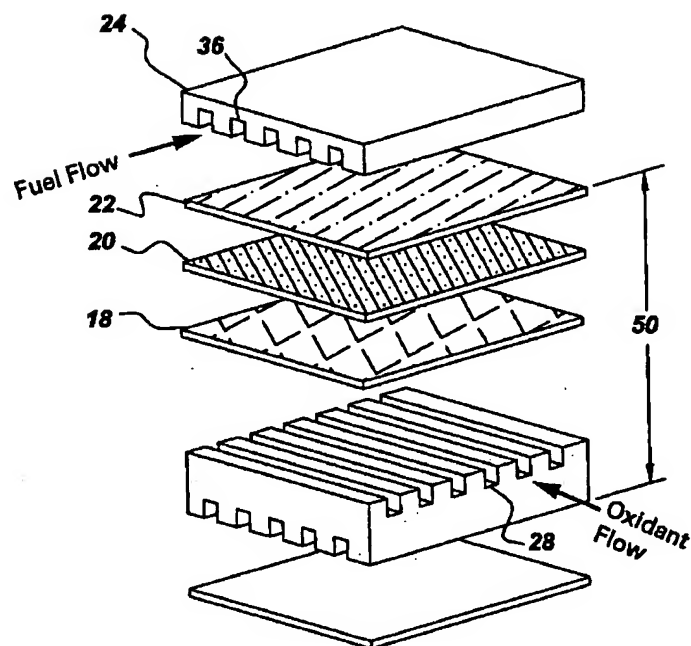
PRIOR ART

Proposed Drawing Corrections - Realigned



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**Fig. 2**

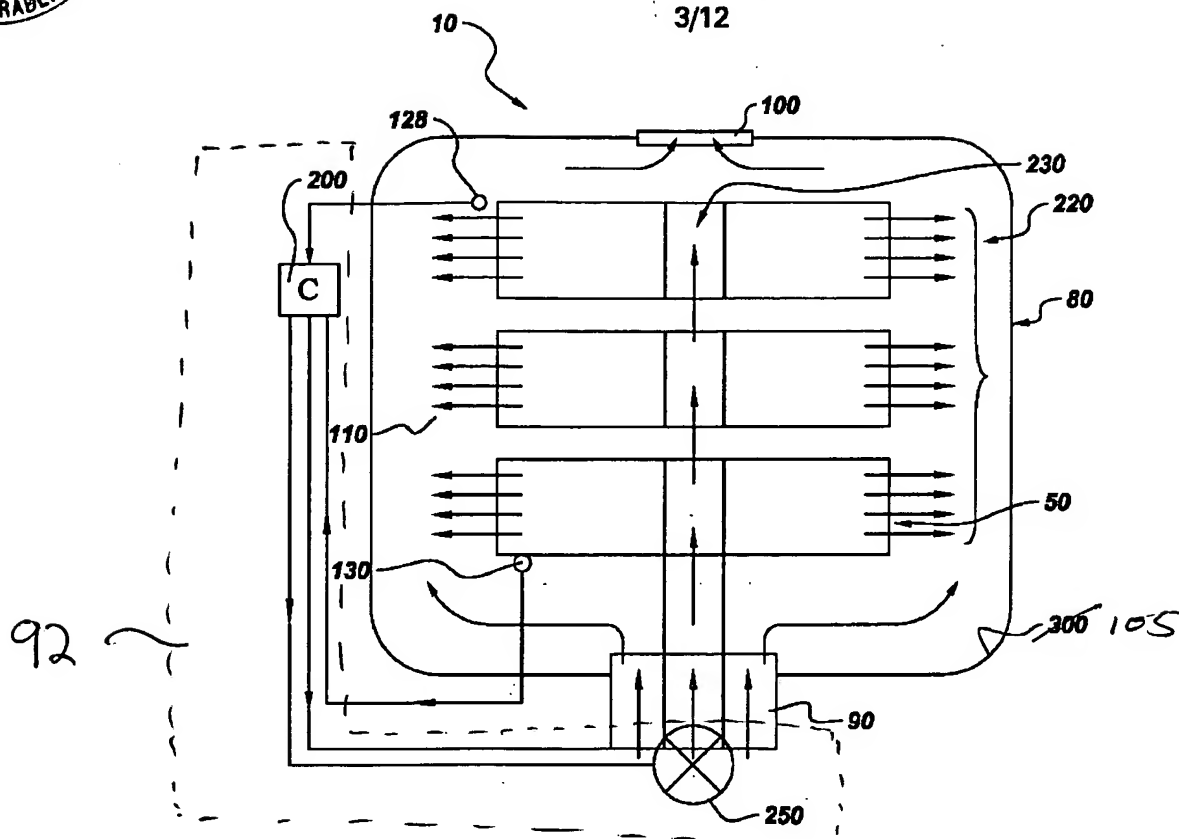
Prior ART

Proposed Drawing Corrections - Redlined



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**Fig. 3**



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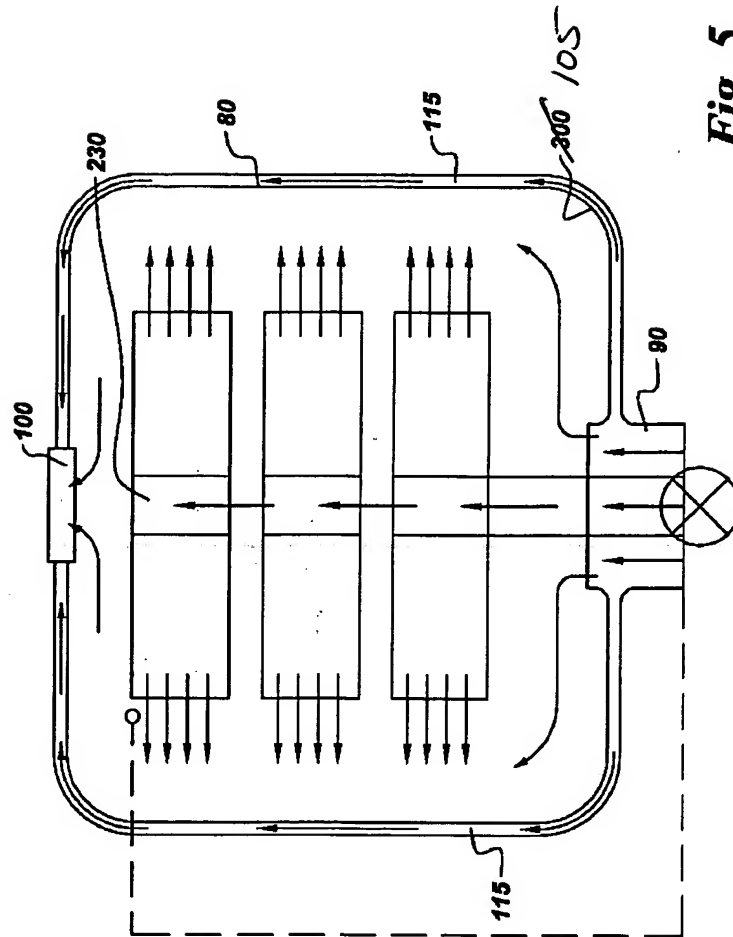


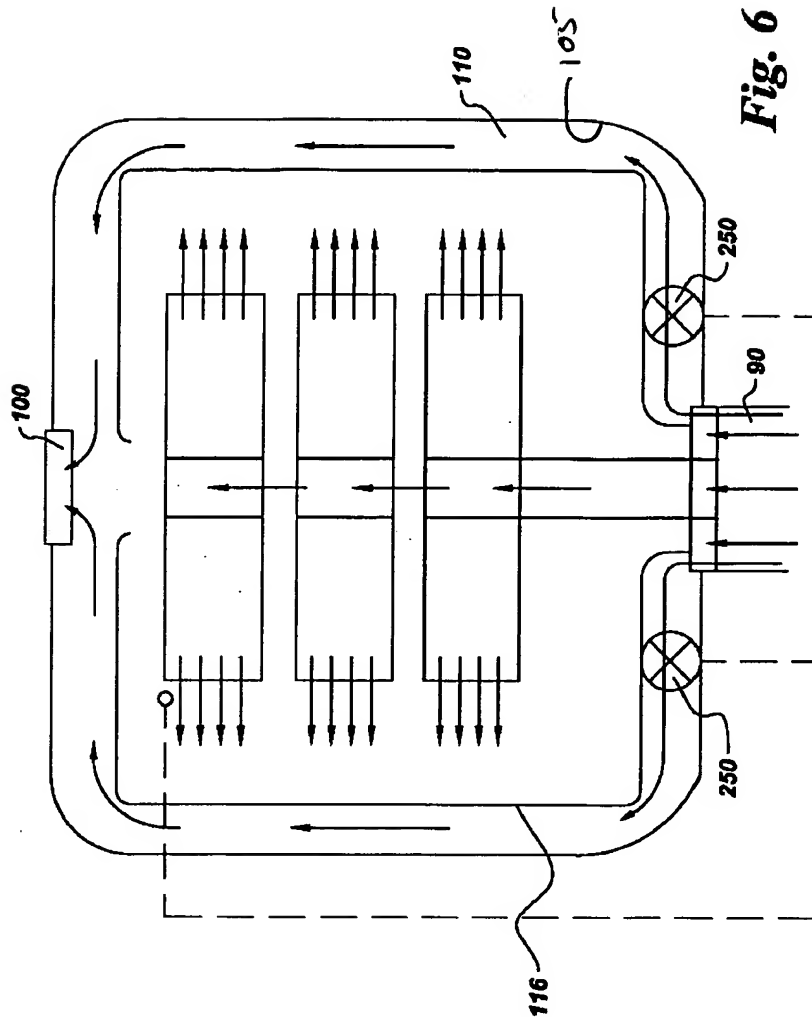
Fig. 5

Proposed Drawing Corrections - Redlined



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**Fig. 6**

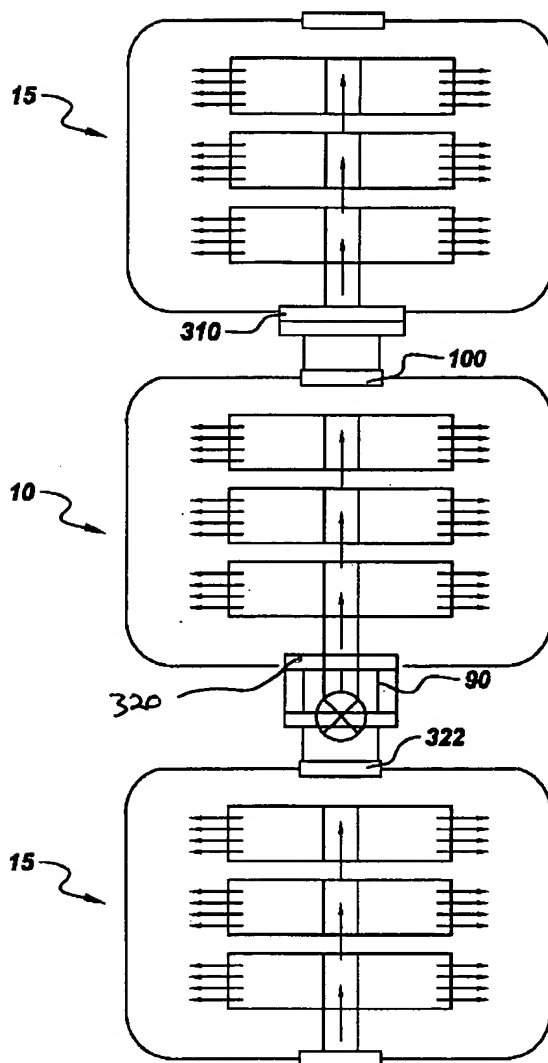
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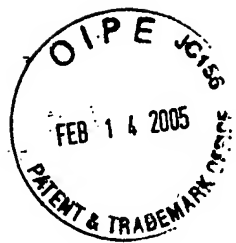
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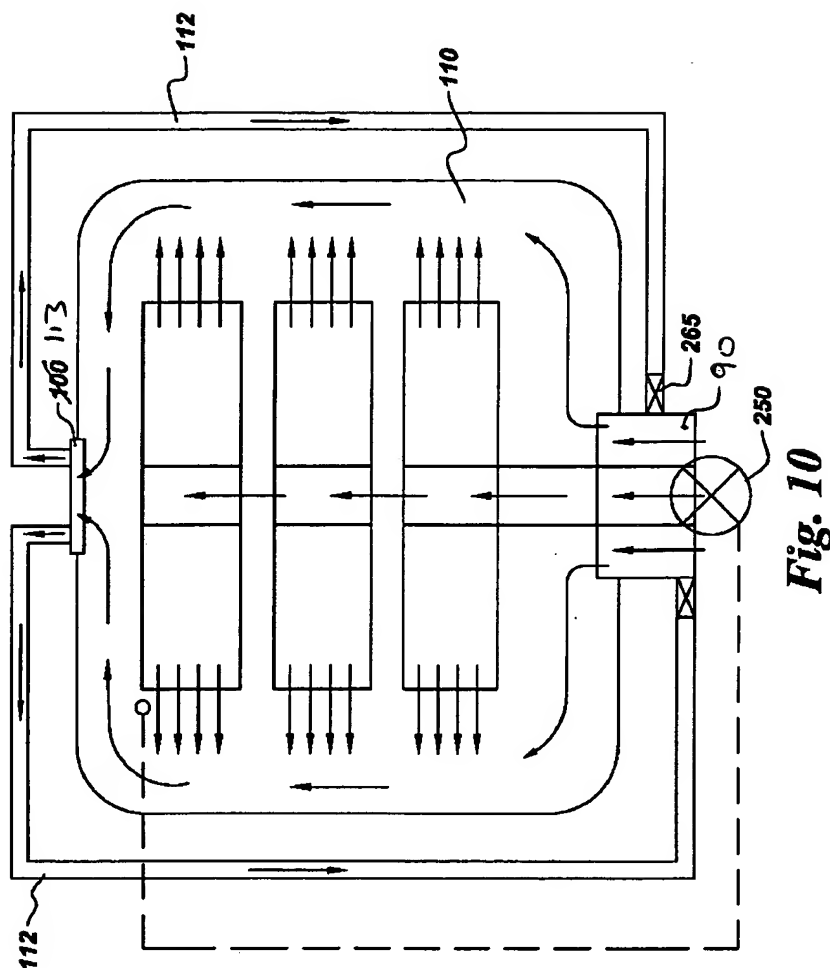
**Fig. 7**

*Proposed Drawing Corrections - Redlined*



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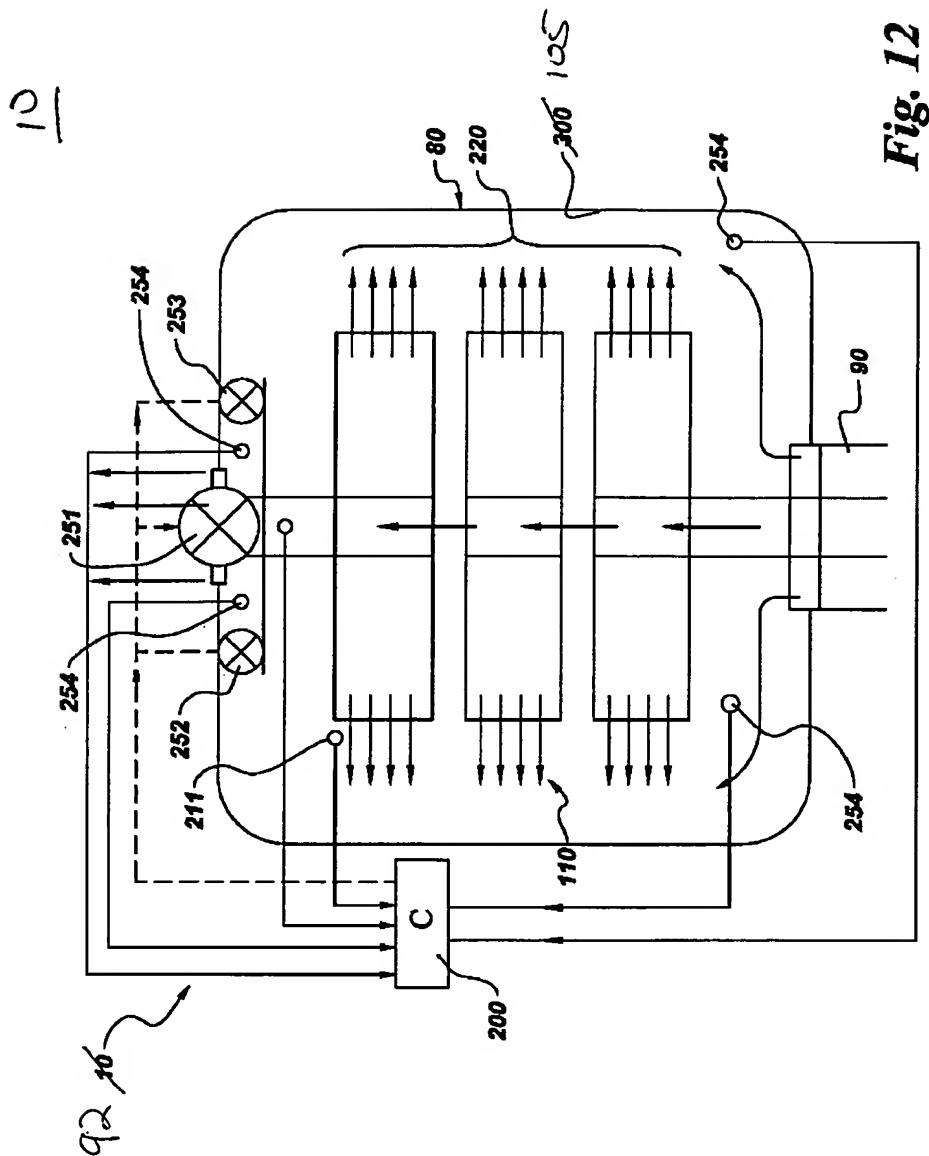
**Fig. 10**

Proposed Drawing Corrections -  
 Redlined



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Proposed Drawing  
 Corrections - Red line